

CLAIMS

What is claimed as the invention is:

1. A negative diopter lens for use as an ophthalmic lens which is substantially stress-free by absence of fringes when analyzed with a strain tester, said lens being formed from an acrylic resin material by the steps of:

providing an injection molding machine having a mold clamp, a mold material injection screw, and two mold plates with at least one mold cavity between the plates, wherein the injection molding machine is operatively controllable to exert variable clamping pressure against at least one of the two mold plates;

preparing the injection molding machine for operation with an acrylic resin molding material by inputting control parameters into a control system, the control parameters including: plastic temperature, plastic flow rate, plastic pressure, plastic cooling rate, clamp closing velocity, velocity-pressure changeover position and coining stroke;

initiating a mold process by closing the mold plates together under a specified primary clamp pressure;

advancing the injection screw to partially fill the mold cavity with acrylic resin material and to reach a VP changeover position;

applying a secondary clamp pressure greater than the primary clamp pressure to perform a coining operation on the acrylic resin material in the mold;

holding the injection screw according to time and pressure control parameters;

advancing the injection screw according to packing time and pressure control parameters;

allowing the acrylic resin material to solidify and cool; cooling time;

separating the mold plates; and

ejecting the negative diopter lens out of the mold cavity.

2. The lens of claim 1 wherein said acrylic resin is polymethylmethacrylate.

3. The lens of claim 1 wherein molecules of the acrylic resin material are substantially aligned throughout the lens.

5 4. The lens of claim 1 wherein a substantially uniform stress level exists throughout the lens.

5. The lens of claim 1 having a diopter in an approximate range of -0.25 to -1.50.

6. The lens of claim 1 having an impact resistant strength sufficient to pass a standardized impact test ANSI Z80.1-1995.

10 7. A negative diopter lens for use as an ophthalmic lens which is substantially stress-free, the lens being formed from an acrylic resin material by a process comprising the steps of:

15 providing an injection molding machine having a mold clamp, and a mold injection screw, at least three mold plates wherein at least one mold cavity is formed between at least two of the three plates, wherein the injection molding machine is operatively controllable to exert variable clamping pressure against at least one of the at least three mold plates;

preparing the injection molding machine for operation with an acrylic resin molding material by inputting control parameters into a control system, the control parameters including: plastic temperature, plastic flow rate, plastic pressure, plastic cooling rate, clamp closing velocity, velocity-pressure changeover position, and coining stroke;

20 initiating a mold process by closing at least two of the at least three mold plates together under a specified primary clamp pressure;

advancing the injection screw to partially fill the mold cavity with acrylic resin material and to reach a VP changeover position;

25 applying a secondary clamp pressure greater than the primary clamp pressure, to perform a coining operation on the acrylic resin material in the mold cavity;

holding the injection screw according to time and pressure control parameters;

advancing the injection screw according to packing time and pressure control parameters;

allowing the acrylic resin material to solidify and cool;

separating the at least two of the at least three mold plates; and

5 ejecting the negative diopter lens out of the mold cavity.

8. The lens of claim 1 wherein said acrylic resin is polymethylmethacrylate.

9. The lens of claim 1 wherein molecules of the acrylic resin material are substantially aligned throughout the lens.

10. The lens of claim 1 wherein a substantially uniform stress level exists throughout the lens.

11. The lens of claim 1 having a diopter in an approximate range of -0.25 to -10.00.

12. The lens of claim 1 having an impact resistant strength sufficient to pass a standardized impact test ANSI Z80.1-1995.